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2. A real species is "a group of individuals of identical constitution, unable to form more than one kind of gametes; all monogametic individuals of identical constitution consequently belong to one species."

3. A "Linneon," says Lotsy, "is a vestigial group of a once much larger group of differently constituted types, born of a cross, which is apt to simulate a species by the overwhelming majority of the dominant types it contains, as a result of free-intercrossing, combined with a favoring of the dominants by a process of selection, weeding out the weaker or more conspicuous recessives; this uniformity being more apparent than real, because pure dominants are indistinctible, in most cases, from dominant-hybrids."

4. In another place the author states briefly his idea of the causal factors of evolution. "The *vera causa* of the production of new types consequently is: crossing; the *vera causa* of their extinction: the struggle for life; the selection resulting from the latter is by no means a revival, but is the sign of the struggle of the doomed." Just what is meant one can only conjecture by the context.

In taking the position that no variations or mutations arise except as the result of crossing and subsequent segregation, the author throws out of court the mutants that have arisen in such carefully controlled experiments as those of MORGAN and his pupils on *Drosophila*. He challenges the reader to produce a single case of mutation in a true species, which, according to him, is a type that produces only one kind of gamete and shows no variability in F_1 and F_2 generations. In other words, if a mutation does occur it may be taken as *prima facie* evidence of impurity in the stock. Such an argument leads nowhere.

The author follows his theory to its logical conclusion and attempts to show that even classes and orders must have been the result of crossing. We fail to see the necessity of forcing a theory, that seems fairly reasonable when applied within limits, to such an absurd length. If we object, we are told that "a formation of new classes is not in action at the present moment, so that it is illegitimate to claim that one who wants to explain evolution must demonstrate how such a formation of new classes goes on."

In conclusion, the reviewer would like to recommend the reader to the second edition of this book, which, if it ever appears, will doubtless be a considerable improvement on the first.—H. H. NEWMAN.

MINOR NOTICES

Forestry for boys.—In a volume dedicated to the youth of America and to the leader of the Boy Scouts, MOON² has described in a readable manner the problems and processes of tree growth, forest development, and forest utilization. The extent and economic value of our forests are well emphasized

² Moon, F. F., *The book of forestry*. 8vo. pp. xvii+315. *figs. 64.* New York: Appleton. 1916. \$1.75.

and the importance of their conservation made clear. The harvesting and utilization of the timber crop is described in an interesting manner, as well as the training and duties of the forester. Some attention is given to such forest industries as maple sugar making, nut growing, resin production, and wood distillation. A word is said about the value and care of shade trees, and a glance is taken at the future possibilities of forestry, everything being treated in a non-technical way likely to interest the "Boy Scout" and many of his elders. The latter part of the book is devoted to very brief descriptions of some 50 trees, each being illustrated by a small drawing of leaves and flowers or fruit.

While neither a textbook nor a scientific treatise, it is interesting and seems well suited to the purpose of interesting the public and more particularly the boys, in the forest and the forester as they concern the happiness and prosperity of our land.—GEO. D. FULLER.

Soil bacteriology.—A laboratory manual of soil bacteriology by FRED³ is intended as a guide to teachers and students in courses given in soil bacteriology. The subject is logically developed and directions are given in clear, concise form. There is perhaps no branch of bacteriology so intimately associated with chemistry as soil bacteriology, and therefore considerable attention is given to this phase of the subject. There are a number of excellent illustrations in the book, and one of the most valuable features is the fairly complete assortment of recipes for preparing culture media suitable for the study of soil bacteria. Special sections deal with methods of quantitative and qualitative chemical methods of analysis. Provision is made at the conclusion of exercises for the student to record results in tabular form, a feature which adds materially to the value of the book.

It is being realized in agricultural schools that the study of soil bacteriology is of eminent importance, and this manual will undoubtedly be appreciated by those interested in such courses.—P. G. HEINEMANN.

North American flora.—The first part of Vol. 21 begins the Chenopodiales by presenting the Chenopodiaceae monographed by STANLEY.⁴ There are 195 species recognized, distributed among 27 genera. A new genus (*Meiomeria*) is based upon *Chenopodium stellatum* S. Wats. The large genera are *Atriplex* (96 species, 20 of which are new), *Chenopodium* (52 species, 13 of which are new), and *Dondia* (20 species, 7 of which are new). New species are also described in *Salicornia* (2) and *Endolepis*. One of the remarkable features of the family is the number of small genera, 13 being represented by a single species, and 4 by 2 species. In fact, 177 of the 195 species are included in 4 of the 27 genera.

³ FRED, EDWIN B., A laboratory manual of soil bacteriology. 12mo. pp. 170. Philadelphia: Saunders Co. 1916. \$1.25.

⁴ North American Flora 21: part 1. pp. 1-93. Chenopodiales: Chenopodiaceae, by P. C. STANLEY. New York Botanical Garden. 1916.